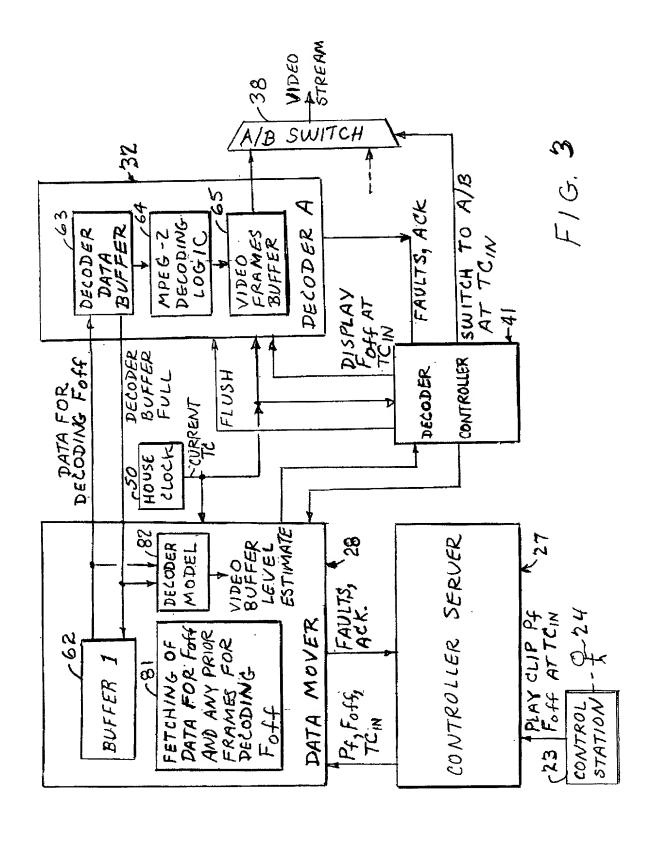
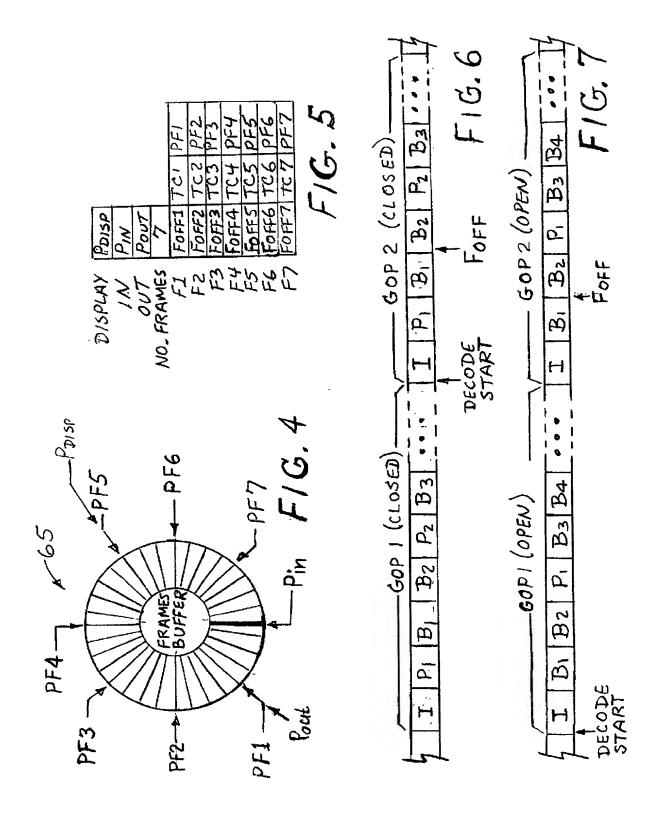
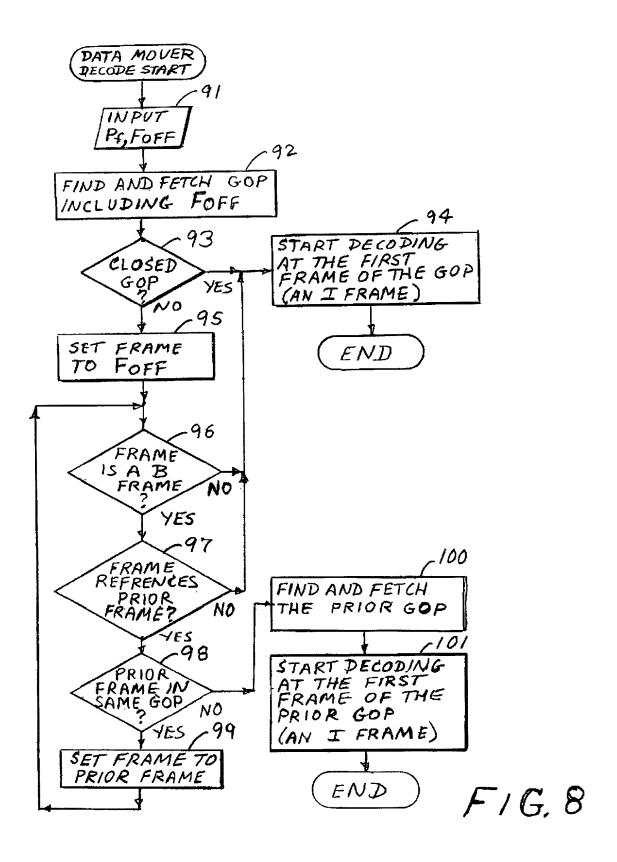


F1G, 2







MPEG DECODING

101

ALLOCATE AN IP ADDRESS TO THE DECODER ARRAY CONTROLLER PORT USING A COMMON IP PROTOCOL (DHCP)

-102

ESTABLISH A SAFE CONNECTION

BETWEEN EACH DATA MOVER AND

EACH RESPECTIVE DECODER ARRAY

-103

CONTROL STATION RECEIVES
FROM AN OPERATOR A REQUEST
TO START A CLIP WITH OR
WITHOUT SPECIFYING A STARTING
TIME CODE (TCIN) OR FRAME (FOFF)

104

THE DATA MOVER OPENS THE
FILE OF THE REQUESTED CLIP
AND DETERMINES WHERE IN THE
CLIP THE DECODER NEEDS TO
BEGIN DECODING FOR DECODING
OF THE FRAME WITH ANY
SPECIFIED TOIN OR FOFF

-105

THE DATA MOVER PRE-FILLS
THE DATA BUFFER OF THE
PECODER "A" WITH ENOUGH DATA
TO ALLOW THE DECODER "A" TO
DECODE AND FILL ITS VIDEO
FRAMES BUFFER

A

THE DATA MOVER SENDS ANY TO THE DECODER "A", OR TCIN ASSIGNS A TCIN BASED ON THE HOUSE CLOCK, AND SENDS THE SPECIFIED OR ASSIGNED TOIN TO THE DECODER "A", THE HOUSE CLOCK IS SHARED BETWEEN THE VIDEO SERVER AND THE PECODER FOR SYNCHRONIZATION. ARRAY DATA MOVER SENDS TO THE DECODER "A" THE TO OF THE FIRST FRAME AS WELL AS THE FRAME OFFSET STARTING WITH AN I FRAME AND A GOP HEADER, NOT NECESSARILY THE FIRST GOP

AT THE REQUESTED TC,N, THE
DECODER "A" STARTS DISPLAYINGTHE VIDEO FRAMES STARTING
WITH THE ONE WITH THE
REQUESTED OFFSET FOFF. AT THE
SAME TIME, THE DECODER "A"
BEGINS REQUESTING MPEG-2
TS DATA FROM THE DATA MOVER
AT A RATE DICTATED BY THE
BIT RATE OF THE DECODINGPROCESS

 $\mathcal{B}$ 

-109

AFTER THE START OF PLAY OUT THE DATA MOVER FETCHES A NEW PLAY COMMAND AND TCIN OR GENERATES A TCIN MATCHING THE LAST FRAME THAT WILL BE PLAYED ON DECODER CHANNEL "A".

110

THE DATA MOVER PRE-ROLLS
DATA TO THE DECODER "B"
FOR, PLAY OUT ON DECODER
CHANNEL "B".

-///

THE DECODER "B" FILLS ITS
VIDEO FRAMES BUFFER AND SETS
ITS DISPLAY POINTER TO THE FIRST
FRAME DEFINED BY THE FRAME
OFFSET SPECIFIED BY THE NEW
PLAY COMMAND, THE DECODER
"B" WAITS FOR THE TIME OF
THE TCHY OF THE NEW PLAY
COMMAND.

C

F1G.11

The first form the star of the first than the star of the first form that the star of the

-112

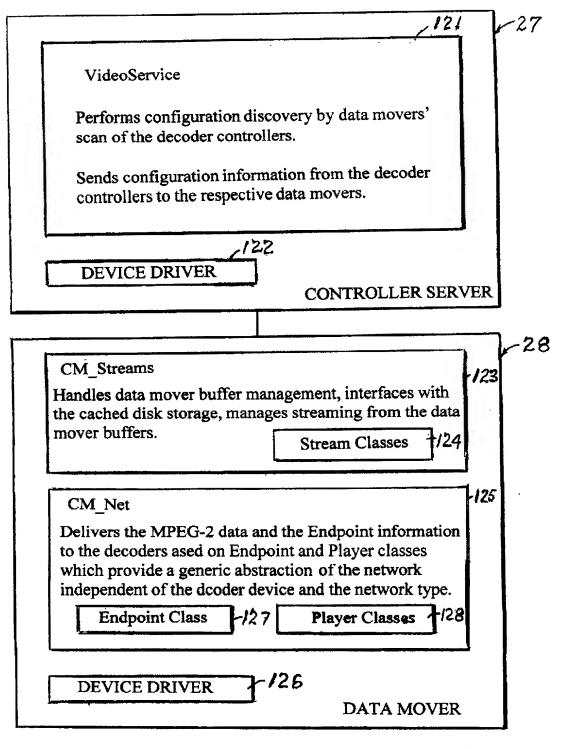
AT THE REQUESTED TON, THE A/B
SWITCH SWITCHES THE VIDEO
STREAM FROM DECODER CHANNEL
"A" TO DECODER CHANNEL"B".
THE PLAY OUT FROM DECODER "A"
STOPS AT THE END OF THE
CURRENT GOP IN THE DECODER "A".

-113

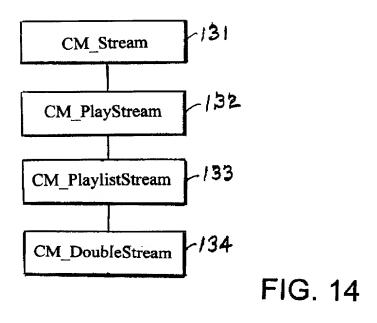
THE DATA MOVER FLUSHES THE DECODER "A" AND PREPARES TO CUE A NEW CLIP INTO DECODER "A" WHEN REQUESTED BY THE OPERATOR

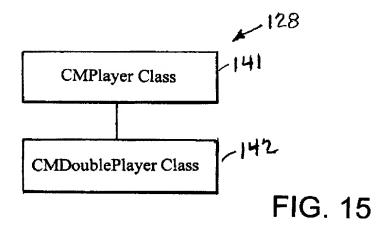
END

F1G. 12



F1G. 13





## Control Protocol

## Configuration.

Allows the data mover to determine the configuration of the decoder array and set up any configuration parameters.

Commands: Query Status, Configure

### Streaming.

Commands: PrerollClip, ModifyDisplayTime, CancelClipPreroll, PauseClip, Controls delivery of streams (i.e., timing, clips, transition type). ResumeClip, ModifyClip.

# Asynchronous status reports.

Commands: ClipHasStarted, ClipHasEnded, ClipIsEnding, TrapMessage, EditSummary, Asynchronous reports of significant events from the decoder array to the data mover.

#### Fdit

Commmands: Jog forward/backward, Shuttle forward/backward, Stop, Goto a specific Allows all decoders in the decoder array to be controlled by an edit review station. timecode, and normal Play.

#### Format of Streaming Protocol Ethernet Packet

Ethernet Header	(14 bytes)
IP Header	
	(20 bytes, min) (60 bytes, max)
UDP Header	
	(8 bytes)
Streaming Protocol Head	er
	(32 bytes)
Optional Data	
(6-26 bytes, min, o (1400-1440 bytes, max, o	lepending on IP hdr) depending on IP hdr)
Frame Checksum	(4 bytes)

FIG. 17

Data Message Header Format

Request Message Header Format

Request message number

Clip ID Number

Sequence Number

sbeed

Reserved

state

window size

byte offset

RESERVED

RESERVED

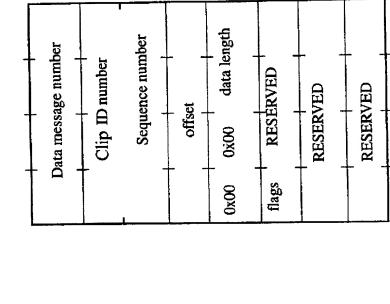


FIG. 1

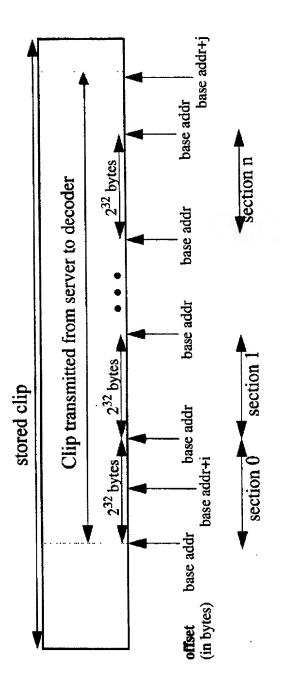
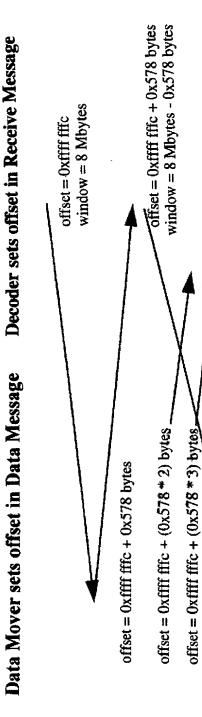


FIG. 20

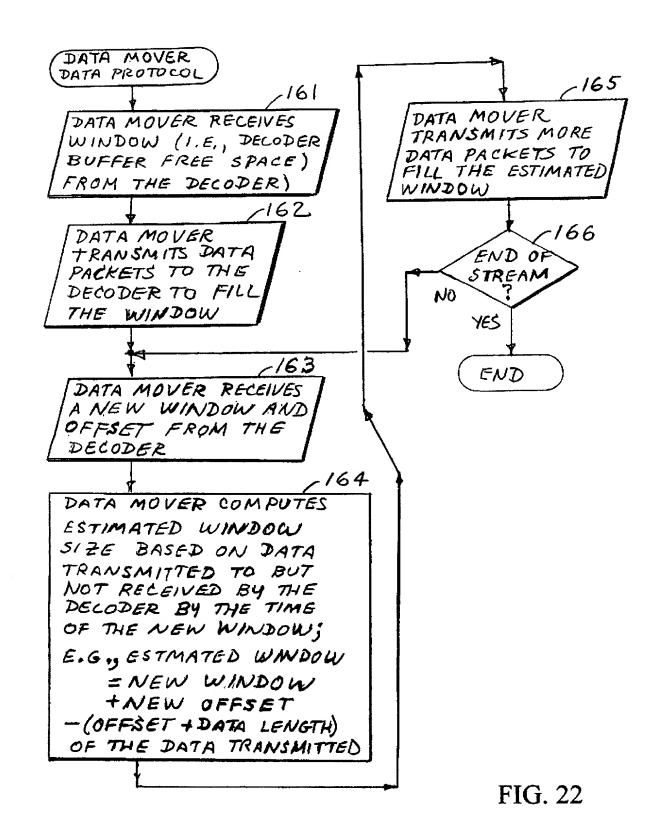


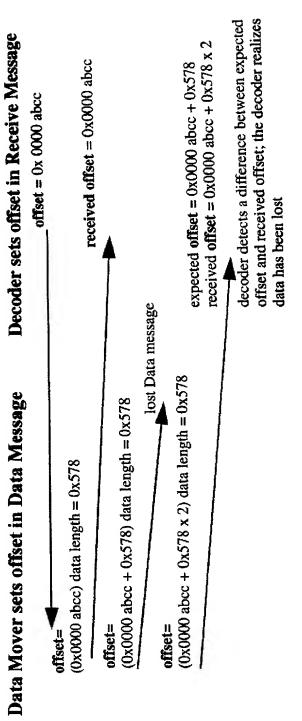
Data mover knows that real window size is not

8 Mbytes - 0x578 bytes since two more data messages are in transit with 0x578 bytes each.

Data mover calculates true window size

FIG 2





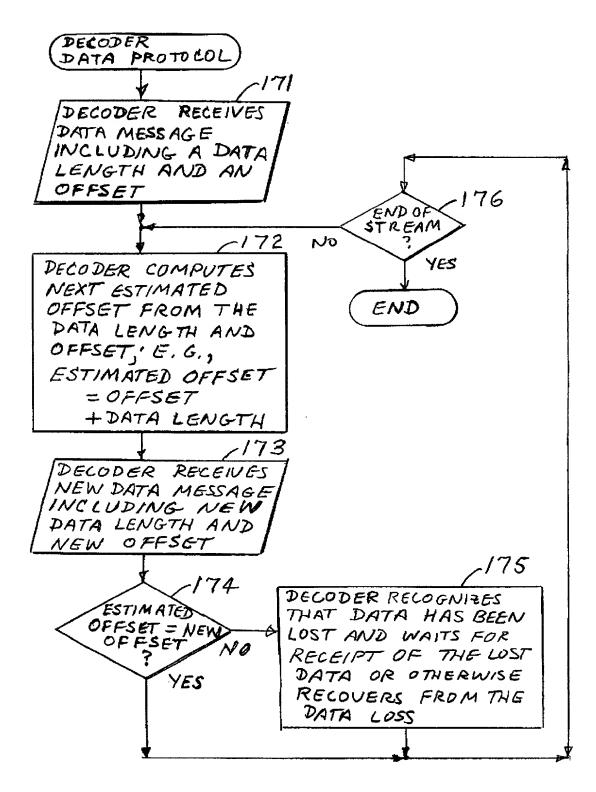


FIG. 24

# Definition of Streaming States

Streaming State	Definition
Cueing	Data mover sends data to the decoder, at least up to the time code that must be displayed. The data rate can be at a rate convenient for
	the data mover. The decoder consumes the data at 1x real time. It is not important if the decoder underflows, since the underflow would be before the display time.
Streaming	The data mover sends data to the decoder at 1x real time and the decoder consumes the data at 1x real time; the decoder can underflow/overflow and it will affect the picture presented to the viewer.
Stopped	The decoder is not consuming data. During this state, the decoder continues to send Request messages at the configured Request interval.
non-overlapped	This state requires that the decoder send a new Request message only after receiving a response from the previous Request message. The data mover may use this mode for testing.

Decoder

Data Mover